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EXAMINER	
BATTAGLIA, MICHAEL V	
ART UNIT	**PAPER NUMBER**
2652	

DATE MAILED: 11/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)	
	10/008,196	DE VRIES ET AL.	
	Examiner	Art Unit	
	Michael V Battaglia	2652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 July 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5-9 and 12-16* is/are rejected.

7)☒ Claim(s) *3,4,10 and 11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This action, dated October 25, 2004, is in response to Applicant's amendment, filed July 7, 2004. Claims 1-16 are pending.

Claim Objections

1. Claims 13 and 16 are objected to because of the following informalities.

a. On line 1 of claim 13, replacing "1" with –8—is suggested so that the claim is not a repeat of claim 6. Claim 13 will be interpreted as being dependent on 8 in the prior art rejections below.

b. On line 3 of claim 16, replacing ".." with --.-- is suggested.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 5-9 and 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoo et al (hereafter Yoo) (US 6,091,691) in view of Katayama (US 6,201,780).

In regard to claim 1, Yoo discloses an optical head for scanning a first optical record carrier including a first information layer and a first transparent layer having a first thickness and for scanning a second optical record carrier including a second information layer and a second

transparent layer having a second thickness different from the first thickness (Fig. 8A, elements 30A and 30B), the head including a radiation source for generating a first radiation beam having a first wavelength and a second radiation beam having a second wavelength different from the first wavelength (Fig. 8A, elements 41 and 45 and Col. 11, lines 1-5), the second radiation beam including a central sub-beam (Fig. 2B, portion of the second radiation beam that travels through elements A1 and A2) and an outer sub-beam (Fig. 2B, portion of the second radiation beam that travels through element A3), an optical system for converging the first radiation beam through the first transparent layer to a focus on the first information layer and for converging the second radiation beam through the second transparent layer to a focus on the second information layer (Fig. 8A, element 20, 20'), and a detection system for receiving radiation of the first and second radiation beam from the information layer and including a photo-sensitive area arranged in a detection plane (Fig. 8A, element 43), the optical system including an optical element having a non-periodic phase structure (Figs. 2C and 2D, element A2), the phase structure including a concentric area and inducing a wavefront deviation in the central sub-beam that compensates the difference in spherical aberration due to the first and second transparent layer (Fig. 3A), characterized in that the optical element is transparent for the first radiation beam, the central sub-beam and the outer sub-beam (Figs. 2A and 2B), and that the wavefront deviation induced in the second radiation beam is such that, when the focus of the central sub-beam is located on the second information layer, the radiation of the central sub-beam and the outer sub-beam form a central intensity distribution (Fig. 11, elements B1 and B2) and an outer intensity distribution (Fig. 11, element B3), respectively, in the detection plane, the central intensity distribution and the outer intensity distribution being separated by a substantially dark area (Fig. 11), and the photo-sensitive area captures radiation of substantially only the central distribution (Col. 10, lines 30-42). The

examiner interprets the phase structure of Yoo as being non-periodic because it does not have marked or repeated cycles. In addition, the examiner notes that the optical system of Yoo approximates a flat wavefront deviation in the first radiation beam except in the area of A2 as shown by Figure 2A and that the focal point of the first radiation beam is optimized where the flat wavefront deviation is approximated (Col. 4, lines 56-59). Yoo does not disclose that the phase structure includes a plurality of concentric areas inducing a wavefront deviation in the first radiation beam that globally approximates a flat wavefront deviation.

Katayama discloses a non-periodic phase structure that includes a plurality of concentric areas (Fig. 6a) inducing a wavefront deviation in the first radiation beam that globally approximates a flat wavefront deviation (Col. 11, lines 63-66) and inducing a wavefront deviation in the second radiation beam that compensates the difference in spherical aberration due to the first and second transparent layer (Fig. 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the concentric area of Yoo with the plurality of concentric areas of Katayama, the motivation being to better compensate the difference in spherical aberration due to the first and second transparent layer (as shown by comparing Fig. 7 of Katayama and Fig. 3A of Yoo) and for the flat wavefront deviation to be globally approximated so that the focal point of the first radiation beam is globally optimized.

In regard to claim 8, Yoo discloses an optical head for scanning multiple record carrier types, the head including a radiation source (Fig. 8A, elements 41, 45 and 46) for generating a first radiation beam having a first wavelength and a second radiation beam having a second wavelength different from the first wavelength (Col. 11, lines 1-5), the second radiation beam including a central sub-beam (Fig. 2B, portion of the second radiation beam that travels through elements A1

disclose that the phase structure includes a plurality of concentric areas inducing a wavefront deviation in the first radiation beam that globally approximates a flat wavefront deviation.

Katayama discloses a non-periodic phase structure that includes a plurality of concentric areas (Fig. 6a) inducing a wavefront deviation in the first radiation beam that globally approximates a flat wavefront deviation (Col. 11, lines 63-66) and inducing a wavefront deviation in the second radiation beam that compensates the difference in spherical aberration due to the first and second transparent layer (Fig. 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the concentric area of Yoo with the plurality of concentric areas of Katayama, the motivation being to better compensate the difference in spherical aberration due to the first and second transparent layer (as shown by comparing Fig. 7 of Katayama and Fig. 3A of Yoo) and for the flat wavefront deviation to be globally approximated so that the focal point of the first radiation beam is globally optimized.

In regard to claims 2 and 9, Yoo discloses that the photo-sensitive area has an edge arranged in the dark area of the intensity distribution (Fig. 11).

In regard to claims 5 and 12, Yoo discloses the phase structure introduces a defocus in the outer sub-beam (Fig. 2B, element A3). The examiner notes that the focus of the light going through the A3 portion of the phase structure deviates from the accurate focal point and is therefor defocused by the phase structure.

In regard to claims 6 and 13, Yoo discloses the axial distance between the focus of the central sub-beam and the focus of the outer sub-beam is at least 12.5 um (Fig. 2B). The examiner notes that the axial difference between the focus of the central sub-beam (Fig. 2B, portion of the second radiation beam that travels through elements A1 and A2) and the focus of the outer sub-

and A2) and an outer sub-beam (Fig. 2B, portion of the second radiation beam that travels through element A3), an optical system (Fig. 8A, element 20, 20') for converging the first radiation beam upon a first media type (Fig. 8A, element 30A) to a focus and for converging the second radiation beam through upon a second media type (Fig. 8A, element 30B), the optical system including an optical element (Figs. 2C and 2D, element A2) having a non-periodic phase structure, the phase structure including a concentric area and inducing a wavefront deviation in the central sub-beam that compensates the difference in spherical aberration due to the first and second media types (Fig. 3A), wherein the optical element is transparent for the first radiation beam, the central sub-beam and the outer sub-beam (Figs. 2A and 2B), a detection system (Fig. 8A, element 43) for receiving radiation of the first and second radiation beam from the first and second media types including a photo-sensitive area arranged in a detection plane, and wherein the wavefront deviation induced in the second radiation beam is such that, when the focus of the central sub-beam is located on the second information layer, the radiation of the central sub-beam and the outer sub-beam form a central intensity distribution (Fig. 11, elements B1 and B2) and an outer intensity distribution (Fig. 11, element B3), respectively, in the detection plane, the central intensity distribution and the outer intensity distribution being separated by a substantially dark area (Fig. 11) and the photo-sensitive area captures radiation of substantially only the central distribution (Col. 10, lines 30-42). The examiner interprets the phase structure of Yoo as being non-periodic because it does not have marked or repeated cycles. In addition, the examiner notes that the optical system of Yoo approximates a flat wavefront deviation in the first radiation beam except in the area of A2 as shown by Figure 2A and that the focal point of the first radiation beam is optimized where the flat wavefront deviation is approximated (Col. 4, lines 56-59). Yoo does not

beam (Fig. 2B, portion of the second radiation beam that travels through element A3) appears to be on the magnitude of many times larger than 12.5 um.

In regard to claims 7 and 14, Yoo discloses a device for scanning two types of optical record carrier, the device including an optical head according to Claim 1 (Fig. 8A) that includes a four segment light detector (Fig. 11). Yoo does not disclose an information processing unit for error correction.

Katayama discloses an information processing unit for error correction that process data from a four segment light detector and generates a focus and tracking error signals (Col. 19, lines 12-22).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include in the device of Yoo the information processing unit of Katayama, the motivation being to generate focus and tracking error signals to correct errors in focusing and tracking.

In regard to claim 15, Katamura discloses that the phase structure compensates for spherical aberrations in the central sub-beam due to different media types (Fig. 1 and Fig. 7 and Col. 12, lines 25-28).

In regard to claim 16, Katamura discloses that the phase structure compensates for spherical aberrations in the central sub-beam due to the first and the second transparent layers (Fig. 1 and Fig. 7 and Col. 12, lines 25-28).

Allowable Subject Matter

3. Claims 3, 4, 10 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In regard to claim 3, none of the references of record alone or in combination disclose or suggest an optical head for scanning a first optical record carrier including a first information layer and a first transparent layer having a first thickness and for scanning a second optical record carrier including a second information layer and a second transparent layer having a second thickness different from the first thickness, the head including a radiation source for generating a first radiation beam having a first wavelength and a second radiation beam having a second wavelength different from the first wavelength, the second radiation beam including a central sub-beam and an outer sub-beam, an optical system for converging the first radiation beam through the first transparent layer to a focus on the first information layer and for converging the second radiation beam through the second transparent layer to a focus on the second information layer, and a detection system for receiving radiation of the first and second radiation beam from the information layer and including a photo-sensitive area arranged in a detection plane, the optical system including an optical element having a non-periodic phase structure, the phase structure including a plurality of concentric areas inducing a wavefront deviation in the first radiation beam that globally approximates a flat wavefront deviation and inducing a wavefront deviation in the central sub-beam that compensates the difference in spherical aberration due to the first and second transparent layer, characterized in that the optical element is transparent for the first radiation beam, the central sub-beam and the outer sub-beam, and that the wavefront deviation induced in the second radiation beam is such that, when the focus of the central sub-beam is

located on the second information layer, the radiation of the central sub-beam and the outer sub-beam form a central intensity distribution and an outer intensity distribution, respectively, in the detection plane, the central intensity distribution and the outer intensity distribution being separated by a substantially dark area, and the photo-sensitive area captures radiation of substantially only the central distribution, **wherein the phase structure induces a wavefront deviation in the second radiation beam that globally approximates spherical aberration and defocus, the defocus changing the axial distance between the focus of the central sub-beam and the focus of the outer sub-beam.**

In regard to claim 4, none of the references of record alone or in combination disclose or suggest an optical head for scanning a first optical record carrier including a first information layer and a first transparent layer having a first thickness and for scanning a second optical record carrier including a second information layer and a second transparent layer having a second thickness different from the first thickness, the head including a radiation source for generating a first radiation beam having a first wavelength and a second radiation beam having a second wavelength different from the first wavelength, the second radiation beam including a central sub-beam and an outer sub-beam, an optical system for converging the first radiation beam through the first transparent layer to a focus on the first information layer and for converging the second radiation beam through the second transparent layer to a focus on the second information layer, and a detection system for receiving radiation of the first and second radiation beam from the information layer and including a photo-sensitive area arranged in a detection plane, the optical system including an optical element having a non-periodic phase structure, the phase structure including a plurality of concentric areas inducing a wavefront deviation in the first radiation beam that globally approximates a flat wavefront deviation and inducing a wavefront deviation in the

central sub-beam that compensates the difference in spherical aberration due to the first and second transparent layer, characterized in that the optical element is transparent for the first radiation beam, the central sub-beam and the outer sub-beam, and that the wavefront deviation induced in the second radiation beam is such that, when the focus of the central sub-beam is located on the second information layer, the radiation of the central sub-beam and the outer sub-beam form a central intensity distribution and an outer intensity distribution, respectively, in the detection plane, the central intensity distribution and the outer intensity distribution being separated by a substantially dark area, and the photo-sensitive area captures radiation of substantially only the central distribution, wherein **the phase structure introduces a defocus in the central sub-beam.**

In regard to claim 10, none of the references of record alone or in combination disclose or suggest an optical head for scanning multiple record carrier types, the head including a radiation source for generating a first radiation beam having a first wavelength and a second radiation beam having a second wavelength different from the first wavelength, the second radiation beam including a central sub-beam and an outer sub-beam, an optical system for converging the first radiation beam upon a first media type to a focus and for converging the second radiation beam through upon a second media type, the optical system including an optical element having a non-periodic phase structure, the phase structure including a plurality of concentric areas inducing a wavefront deviation in the first radiation beam that globally approximates a flat wavefront deviation and inducing a wavefront deviation in the central sub-beam that compensates the difference in spherical aberration due to the first and second media types, wherein the optical element is transparent for the first radiation beam, the central sub-beam and the outer sub-beam, a detection system for receiving radiation of the first and second radiation beam from the first and second

media types including a photo-sensitive area arranged in a detection plane, and wherein the wavefront deviation induced in the second radiation beam is such that, when the focus of the central sub-beam is located on the second information layer, the radiation of the central sub-beam and the outer sub-beam form a central intensity distribution and an outer intensity distribution, respectively, in the detection plane, the central intensity distribution and the outer intensity distribution being separated by a substantially dark area and the photo-sensitive area captures radiation of substantially only the central distribution, **wherein the phase structure induces a wavefront deviation in the second radiation beam that globally approximates spherical aberration and defocus, the defocus changing the axial distance between the focus of the central sub-beam and the focus of the outer sub-beam.**

In regard to claim 11, none of the references of record alone or in combination disclose or suggest an optical head for scanning multiple record carrier types, the head including a radiation source for generating a first radiation beam having a first wavelength and a second radiation beam having a second wavelength different from the first wavelength, the second radiation beam including a central sub-beam and an outer sub-beam, an optical system for converging the first radiation beam upon a first media type to a focus and for converging the second radiation beam through upon a second media type, the optical system including an optical element having a non-periodic phase structure, the phase structure including a plurality of concentric areas inducing a wavefront deviation in the first radiation beam that globally approximates a flat wavefront deviation and inducing a wavefront deviation in the central sub-beam that compensates the difference in spherical aberration due to the first and second media types, wherein the optical element is transparent for the first radiation beam, the central sub-beam and the outer sub-beam, a detection system for receiving radiation of the first and second radiation beam from the first and second

media types including a photo-sensitive area arranged in a detection plane, and wherein the wavefront deviation induced in the second radiation beam is such that, when the focus of the central sub-beam is located on the second information layer, the radiation of the central sub-beam and the outer sub-beam form a central intensity distribution and an outer intensity distribution, respectively, in the detection plane, the central intensity distribution and the outer intensity distribution being separated by a substantially dark area and the photo-sensitive area captures radiation of substantially only the central distribution, **wherein the phase structure introduces a defocus in the central sub-beam.**

Response to Arguments

4. Applicant's arguments filed July 7, 2004, with respect to the rejections under 35 U.S.C 103(a) over Yoo in view of Katayama have been fully considered but they are not persuasive.

In regard to claim 1, Fig. 2B of Yoo shows the second radiation beam. The portion of the second radiation beam that travels through portions A1 and A2 of the optical system (Fig. 2B, element 20) and not the portions themselves is the central sub-beam (light beam shown in Fig. 2B with solid lines). The portion of the second radiation beam that travels through portion A3 of the optical system and not portion itself is the outer sub-beam (light beam shown in Fig. 2B with dashed lines). Fig. 3A clearly shows that the phase structure (Figs. 2A-2D, element A2) induces a wavefront deviation to the second radiation beam that compensates for a difference in spherical aberration, which is caused when discs of different thickness are read with the same optical system. Lastly, Applicant states that the optical element of Katayama (Fig. 6(b), element 24) imparts a phase difference of 2π to 780nm light as the basis for the conclusion that optical element of Katayama has a periodic phase structure. However, the Examiner is unable to understand how the

phase change imparted by the optical element, which has to do with the height of the plurality of concentric areas (Fig. 6(b), element 21), has any bearing on whether or not the optical element has a periodic phase structure. It also noted that the optical element of Katayama imparts a phase difference of 2π to 650nm light (Col. 12, lines 39-43) instead of to 780nm light as suggested by Applicant and that the dimensions of the plurality of concentric areas given in Fig. 8 show that the optical element has a non-periodic phase structure.

Arguments in regard to claims 2 and 7 are unpersuasive because they rely on unpersuasive arguments regarding the allowability of claim 1.

In regard to claim 5, the plurality of concentric areas of Katayama are limited to the area through which light that is converged on the second information layer travels and outer portion (Figs. 2C and 2D, element A3) of the phase structure of Yoo is not affected by the plurality of concentric areas of Katayama.

In regard to claim 6, any reasonable viewing of Fig. 2B of Yoo indicates that the axial distance between the focus of the central sub-beam and the focus of the outer sub-beam is at least 12.5 um. It is noted that the thickness of the second optical record carrier (Fig. 2B, element 30B) is 1.2mm (Col. 8, line 15) and the second working distance (Fig. 2B, element WD2) is 1.525mm (Col. 7, line 4).

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael V Battaglia whose telephone number is (703) 305-4534. The examiner can normally be reached on 5-4/9 Plan with 1st Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T Nguyen can be reached on (703) 305-9687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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